SUBCUTANEOUS RUPTURE OF THE SPLEEN.*

REPORT OF CASES WITH REMARKS.

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CASE I.—Robert S. Age 8. History of having fallen 8 feet down a cellar way, striking on left side of abdomen in left hypochondriac region. Accident November 3, 1907.

The first urination after the accident showed evidence of blood. He did not vomit; no marked evidence of shock; bowels moved normally. The next two succeeding days he was not so well and when I saw him two days later he presented the following symptoms:

Expression anxious, indicating some severe abdominal lesion. Some meteorism, but no vomiting. Temperature 102; pulse 20; respiration rapid and shallow. Lips and mucous membrane pale. Rigidity of left rectus muscle; tenderness most marked over splenic area. Complained of pain in left upper abdomen. The kidneys and bowels had acted normally and showed no evidence of blood. The degree of traumatism and its application to the splenic area, followed by the evidence above related, makes the diagnosis of contusion of the spleen, slow hemorrhage and a low grade, more or less localized, peritonitis, most reasonable. He also had a contusion of the left kidney as evidenced by the one hemorrhage. The boy had a slow but satisfactory recovery without operation.

CASE II.—Jacob H. Age 21. Painter. Was admitted to the German Hospital on the afternoon of September 28, 1907, having been referred by Dr. Klemm.

Patient's previous history of no importance or bearing on present condition.

Dr. Klemm kindly furnished the notes of the accident and the condition immediately following:

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"Jacob H. came to my office stating that two hours before he had fallen from bay window on a fence, striking on his upper abdomen. He soon recovered sufficiently to walk to his home, a distance of ten squares, then to my office another six squares and back to his home. He was pale, not able to stand fully erect; his pulse was 96; temperature normal; he referred his pain to the epigastrium, radiating toward the left side and the back. I advised him to go to the German Hospital for observation, to which his mother objected, then I ordered him to bed and to let me know if he got worse. The next day I found him, with abdomen distended, pulse 136, temperature 100, more pale and willing to go to the hospital at once."

On admission he was very pale, expression anxious. Temperature 100; pulse 148; respiration 26. Abdomen showed no ecchymosis, bruise, cut or evidence of traumatism. Lungs clear. Heart action rapid. No murmurs. Pulse rapid, weak and running. Abdomen moderately distended; general rigidity and marked tenderness. Complained of severe abdominal pain, most intense in the left hypochondrium. Hæmoglobin 48 per cent., leucocytes 20,000.

Operation on admission, 24 hours after the injury. Abdomen was opened through right rectus muscle with line of umbilicus as central point. A large amount of very dark unclotted blood escaped. A rapid survey of small and large intestine and their mesenteries, also of the liver, proved them to be intact. As the examination approached the spleen it was noticed that the blood was clotted and an examination discovered a rent in the spleen. The patient by this time was practically pulseless. Intravenous salt solution was started—a total of 2000 c.c. being given. Another incision through the abdominal wall over the spleen and three pieces of gauze were packed around the organ. A stab wound over the pubis was made for the insertion of a glass drainage-tube; the original wound was closed, excepting at the lower angle, where one piece of gauze was placed for drainage. The abdomen was not washed out. The patient made a slow recovery. On the twentieth day the temperature shot up to 104 and the pulse to 138 without a known cause, and stayed up until the thirty-fifth day, when it again reached normal. The leucocyte count at this time was 9700. Widal negative.

Subcutaneous injuries of the spleen vary from simple contusion to complete pulpification, the extent of the injury being governed by the amount and direction of the applied force and the condition of the organ. An abnormal spleen either enlarged or unduly friable will be more readily and more severely injured by minor degrees of traumatism. That the normal spleen is liable to severe injury is proven by the number of cases on record. At the height of its functional activity, the spleen is engorged with blood and is at this time more liable to injury. This condition occurs some hours after digestion. The two cases herewith reported illustrate rupture in two degrees of severity, in normal or presumably normal organs. Both were in males.

In Berger's collection, 300 cases were in men and 60 in women.

Subcutaneous injuries are more common than through open wounds. Edler's 160 cases show 51.8 per cent. as subcutaneous to 48 per cent. from gun shot and stab wounds.

Berger, Archiv für Klin. Chirurgie, 1902, vol. 68, pp. 768–817, gives a review of all cases up to 1902, from which the following facts have been deduced:

Frequency of rupture of the spleen compared with same injury to the other solid viscera due to traumatism he gives as follows: rupture of spleen, 20 per cent.; rupture of kidney, 22 per cent.; rupture of liver, 37.5 per cent.

Contusion of the spleen regarded as an authentic diagnosis, is in many cases hard to diagnose from rupture. The symptoms are pain and tenderness in region of the spleen, enlargement of the organ, fever, shock without evidence of hemorrhage.

Age of Cases.—Report of German cases: age from 0 to 10, 38 cases; 11 to 20, 33 cases; 21 to 30, 42 cases; 31 to 40, 32 cases; 41 to 50, 15 cases; 51 to 60, 15 cases; over 60, 9 cases. Report of English cases: age from 1 to 10, 11 cases; 11 to 20, 18 cases; 21 to 30, 15 cases; 31 to 40, 15 cases; 41 to 50, 6 cases; 51 to 60, 11 cases; over 60, 11 cases.

NOTE.—One case in a new-born infant, which was dropped on floor in precipitate labor.

Pathology.—Somewhat less than half of the ruptures affected a diseased spleen, in most cases malarial. It was especially common also during acute infections with splenic enlargement.

Of 132 pathological ruptured spleens: 93 were malarial, 15 only enlarged, no cause stated, 5 in typhoid, 1 in typhus, 1 in pneumonia, 3 in leukæmia, 1 in hereditary syphilis and alcoholism with liver cirrhosis, 9 in pregnancy, 1 in tuberculosis, 1 in other diseases.

Spontaneous Rupture.—Referred to by Berger. He gives over 30 examples, some with slight trauma, as bending or in labor. He reports one case in a man lying absolutely still.

Prognosis of Ruptured Spleen.—Unoperated: of 220 cases, 17 recovered—mortality, 92.3 per cent. *Operative results:* splenectomy, 67 cases, 38 recovered, 29 died—mortality, 56.7 per cent.; splenorrhaphy, 2 cases, 1 recovered, 1 died—mortality, 50 per cent.; tamponade, 6 cases, 5 recovered 1 died—mortality, 83.3 per cent.

In the above splenectomies 13 had complicating injuries, of which 9 died. In two of the recovered ones the complications were very slight.

LATER REPORTS OF RUPTURE OF SPLEEN.

1. BEAUMONT. Trans. Clin. Soc. London, 1902-3, xxvi, 261. Reports case of man hit by wagon tongue; spleen was ruptured. Operated. Splenectomy. Developed a left pleurisy and empyema. Had enlarged lymphatics one month after operation. No pathology of spleen.

2. FREUND. St. Louis Med. Cour., 1906, xxiv, 135-137. Reports one case of splenectomy for rupture with recovery. Operation within 24 hours. Noted leucocytosis of 9000 on admission, 18,000 on third day.

3. KIRCHNER. Ibid. Mentions 5 or 6 cases with 3 or 4 recoveries. No exact data.

4. BREWSTER. Boston M. and S. Journ., 1904, cl, 211. Reports a case of rupture of the spleen on a female of 6. Operated evening of the second day, with diagnosis of probable rupture of intestines. Wound in spleen packed, a drain was brought out by counter opening in flank.

5. SIMPSON. Lancet London, 1906, II, 364. Case of splenectomy for ruptured spleen. Operated in 5¾ hours.

6. NOETZEL. W. Beitr. z. klin. Chirurgie, 1906, xlviii, 309. Reports

five cases of splenectomy for rupture. Two recovered. One operated in 24 hours. One on third day. Of the three that died (no pathological report), 1 died apparently of shock, 1 of rupture of liver and heart complicating splenic condition, 1 of rupture of intestine (not found at operation). He calls attention to need of examination for associated lesions of viscera when doubtful.

7. FRANK. Munch. med. Wchnschr., 1906, liii, 189. Reports two cases of splenectomy for rupture. One operated within 24 hours and one on second day. The latter worked 2 days after accident—had subcapsular hemorrhage which broke second day and necessitated operation. Complicated by pneumonia and pleuritis. No pathological report.

8. FONTOYNONT. Bull. et Mem. Soc. de Chir. de Paris, 1905, us. xxxi. Reports a case of splenectomy for rupture in a woman of Madagascar, who had malaria and syphilis. Operated in 2 hours. Spleen removed as was also an injured portion of tail of pancreas. Clamps left on vessels. Spleen free of blood weighed 500 grams. It was hypertrophied and malarial.

9. SCHLUETHER. R. E. J. Missouri Med. Ass., 1905-6, 11, 23-26. Reports splenectomy in boy of 14, for rupture. Spleen entirely broken in half. Operated in 18 hours. Bleeding had spontaneously ceased. He notes hypertrophy of lymphatics in second week after operation.

10. ANORAY. Bull. et Mem. Soc. de Chir. de Paris, 1904, xxx, 900-911. Reports two cases of splenectomy for rupture, with recovery. He advises resection of ribs to expose the field of operation. He refers to several other cases and to 3 cases of spontaneous cure.

11. SHERWOOD. Brooklyn Med. Journ., 1906, xx, 62. Reports case of rupture of spleen. Operation in 3 or 4 hours. Hemorrhage all back of peritoneum and no free blood in peritoneal cavity. Spleen and clot left undisturbed and wound closed. Patient recovered.

12. DAVYS. Indian Med. Mag. Calcutta, 1904, xxxlx, 219. Reports spontaneous rupture of spleen in native while lying down. No accident. Died in ½ hour. Postmortem: Spleen has rent in anterior angle; is soft and enlarged to double its size. No pathological report.

13. THURSTON. Ibid. p. 379. Reports operation for peritonitis. Ruptured spleen. Spleen not enlarged. The blood had become encysted, the breaking of which caused the peritonitis. No free blood in abdominal cavity.

The evidence upon which a diagnosis can be established is the history of traumatism to the upper abdomen and especially when applied to the left side; shock, pain, tenderness over the spleen, rigidity of the recti muscles, more marked of the left; later signs of hemorrhage and meteorism. The abdominal wall rarely shows the evidence of force, although it be sufficient to rupture any one or several of the abdominal organs. The absence of ecchymosis or bruising should not mislead one.

As we see these cases in the hospital the impression one receives is that the patient has a serious hurt and urgently requires operation, and it is my opinion that the time spent in making a fine differential diagnosis would be better spent in opening the abdomen on the evidence of a ruptured viscus and repairing the condition or conditions found.

If the diagnosis of injury to the spleen can be established an incision through the left rectus muscle offers the best route for handling the conditions. Unfortunately the signs of hemorrhage into the peritoneal cavity and the meteorism so often obscure the symptoms that we must make a compromise incision, that through the right rectus muscle being the best. The umbilicus should be on a line with the middle of the incision. One can readily and rapidly enlarge upward and downward. Injuries to other organs will be more readily seen and recognized by this route.